

## Centurial-scale cycle observed in oxygen isotope of Holocene stalagmite from central Japan

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Oxygen isotope of stalagmites records local climatic conditions via the meteoric isotope values in water recharge area. Previous studies in China and Japan have revealed that variations in stalagmite oxygen isotope likely indicate variations in intensity of the Asian monsoons. We here present U-Th age and oxygen isotope of two stalagmites collected from the central Japan, which appear prominent centurial-scale cycle. Uppermost 5.3 cm of stalagmite OT02 from Gujo City (Gifu Prefecture) exhibit 9 cyclic changes in its oxygen isotopic values in a period of 8.5-2 ka. Estimated ~650-yr wave length broadly conforms with that of solar activity reconstructed based on radio carbon anomaly. Temperature change was unlikely responsible for the stalagmite isotope because the phase unmatched with the solar activity. The oxygen isotope was low during the cold phases of lower solar activity. The oxygen isotope of OT02 records the change in average isotopic composition of the meteoric water. Meteoric water samples collected at a reference site (Ogaki City) clearly indicate seasonality in the oxygen isotope values. Meteoric waters in winter generally record low isotopic values, likely owing to the Rayleigh distillation that occurs in water vapor mass from the Japan Sea. The records of OT02 can be the change in the winter proportion of meteoric water. This would have increased the stalagmite oxygen isotope during colder periods. A similar ~650-yr cycles appear in the Holocene stalagmite from Odai (Mie Prefecture). The periodicity is also conformable with historical climatic periods, such as Little Ice Age and Medieval Warm Period. We suggest that such cyclic change can be extended back to 8 ka.